MISSOURI BOTANICAL GARDEN BULLETIN

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Azaleas for St. Louis Gardens

Volume XLIV April, 1956 Number 4

COVER: Gable Hybrid Azalea OLD FAITHFUL. These plants have bloomed profusely for ten seasons, normal blooming time being about April 20.

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Missouri Botanical Garden Bulletin

Vol. XLIV APRIL, 1956 No. 4

AZALEAS FOR ST. LOUIS GARDENS

PAUL A. KOHL

OVER twenty years ago, Ernest H. Wilson of the Arnold Arboretum, in his book "If I Were to Make a Garden," devoted a chapter to "The Brilliant Gaiety of Azaleas," and in a still earlier work he included azaleas among the aristocrats of the garden. Azaleas are the true aristocrats for the gardens of the St. Louis area, and, if given a little extra care, can be the most cherished plants in a shrub collection.

In gardening we are entirely dependent upon the changing weather conditions, and very often the St. Louis area is considered one of the most difficult climates in which to garden. We have sudden changes in temperature, dry and wet summers, and late spring freezes; but by comparison with other parts of the country, our climate is not so rigorous as to discourage us from growing some of the choicer plants. We hope we are now emerging from the drought which has gripped this area for a number of years. While counting our plant losses we can't help but wonder what the score is in Florida and the Pacific Northwest after the damaging cold spells, or in the East after the hurricanes and floods and in the West after the floods. At least we are not the only ones who must adapt gardening to a fickle climate, but this adapting is the challenge that tests our abilities and makes gardening such an interesting and rewarding hobby or avocation.

Azaleas are a little more exacting than the average plant in their requirements as to soil, location and moisture and have therefore been considered difficult to grow in this region. We are learning more about them and with the introduction of better varieties are discovering that they are more adaptable to our climate than we realized. There are many, many azaleas, but this article is about the kinds I have grown in the Garden.

For many years, the Garden has used the Indian and Kurume azaleas in its floral displays and in the spring flower shows formerly held in the Arena and Kiel Auditorium. These plants have been grown in large pots, some of them for more than twenty years. This may be considered a good record for this part of the country, but not unusual, for there are instances where

MOLLIS HYBRID AZALEA

The Mollis hybrids may be grown in full sun. The plants are vigorous and the flowers large.

Indian azaleas have been grown in pots in England for more than forty years and the Japanese have very old azaleas trained as Bonsai trees.

While our potted azaleas are watered with city tap water, which contains calcium, they seem to tolerate it if they are grown in soil containing peat and are supplied with nutrients which counteract the accumulation of lime. We have grown azaleas in pure peat and also in sphagnum with excellent results. To keep the plants in good condition we use such materials as cottonseed meal, iron sulphate, ground sulphur, and balanced fertilizers especially prepared for camellias and azaleas. When azalea leaves lose their dark green color we know the plants are in trouble, although we cannot pin-point the cause for the change. The yellowing foliage might be the result of starvation, alkaline soil, or poor drainage. When soil in a pot becomes water-logged, air is excluded and the yellowing leaves are the first symptom of poor drainage. If the drainage is good and an azalea becomes anaemic the cause is probably due to a deficiency of iron and other trace elements, and such a plant is said to be "chlorotic." This does not necessarily mean that there is a shortage of iron in the soil, but it might be in an insoluble form so that plants cannot utilize it. Iron sulphate, used at the rate of from one-half to one ounce to two gallons of water, applied to the roots or sprayed on the foliage, has frequently been used to restore the normal green color to the leaves. A good combination fertilizer for potted azaleas is one teaspoonful of iron sulphate and eight teaspoonsful of a water-soluble fertilizer in one gallon of water.

Iron chlorosis occurs in other plants as well as azaleas. It is a nutritional problem in the citrus groves in central Florida and it is there that great strides have been made in recent years in restoring chlorotic trees through the use of iron chelates (pronounced "keylates"). In 1953 the first iron chelates became commercially available and now they may be had under various trade names such as Edco iron, Azalea Acid Kapco, Sequestrene NaFe, Versen-Ol iron chelate, and Versen-Ol iron chelate on Vermiculite. In the last two years, whenever we fed our potted azaleas, we added 12 per cent chelated iron to the fertilizer at the rate of one-fourth teaspoonful (1 gram) per gallon of water. We have used this new material cautiously on our potted azaleas, but from our experience thus far we feel that we can safely use it on all azaleas and in stronger amounts. The suggested rate of application of Versen-Ol for a 2- to 4-foot azalea in the garden is ½ to 1 ounce in 2 to 4 gallons of water, applied as a soil drench in the root area of the plant. To correct severe chlorosis on alkaline soils, two to three applications may be necessary at six- to eight-week intervals.

Aluminum sulphate has been used to acidify soils, but its continual use may produce aluminum toxicity in plants. Powdered sulphur is much safer and can be used at the rate of 1 pound to 100 square feet per application on light soils and 2 to 3 pounds on heavier soils. Regardless of which

THE KOREAN RHODODENDRON (*Rhododendron mucronulatum*)
THE EARLIEST-FLOWERING RHODODENDRON.

inorganic chemicals are used to increase acidity, it will not be possible to grow good azaleas unless the soil is well supplied with organic matter.

Much is still to be learned about the acidity of the soil in relation to the growth of azaleas and rhododendrons. Many gardeners have probably been discouraged from growing them because of the emphasis placed on the need for acid soil. This is the cultural point which is the most frequently stressed, as if it were the only matter to consider, whereas location, light and shade, moisture, organic content of the soil, and the selection of suitable kinds of azaleas are just as important as the acidity of the soil. In this connection it is interesting to refer to an article in the 1956 *Rhododendron and Camellia Year Book* of the Royal Horticultural Society. Lanning Roper describes the Kurume Punch Bowl in the Great Park at Windsor, a project initiated in 1946 and completed in 1950, with the planting of over 50,000 Kurume azaleas. The following quotation describes the soil, but nowhere in the article is acidity or the pH of the soil mentioned:

> "In the beginning there was some fear of erosion. The soil was sandy, but it had been improved by a great deal of natural forest leaf-mould which had accumulated on the site through the years, coupled with vast quantities of leaf and peat which were dug in as the land was trenched."

It is not intended to dismiss the subject of acidity, but to consider it in its proper relation with the other cultural practices in growing azaleas. A small testing kit can be used to determine the acidity or alkalinity of the soil, or soil samples can be sent to state experiment stations or soil-testing laboratories for analysis and recommendations. The neutral point on the "pH scale" is 7.0, and a degree or two below this point is the range of acidity azaleas prefer. The domestic and imported peats have a strong acid reaction of about pH 4.5, and if a good amount of peat is added to the soil one can be reasonably sure that the degree of acidity will be low enough for azaleas. The addition of sulphur or any other acidifying agent to the soil will reduce the pH, but a fairly accurate reading cannot be obtained until months after the application.

Location: While most of the deciduous azaleas may be grown in full sun, the evergreen and semi-evergreen kinds prefer light shade part of the day. Shade cast by trees or buildings during the hottest part of the day will also prolong the blooming period. Not every garden has a suitable location for azaleas, although by studying the site it is usually possible to create a sheltered spot with hedges, fences, shrubs, or evergreens. High shade cast by trees is preferred, and if the trees are oaks there will be no surface roots to rob the azaleas of food and moisture.

Planting Time: Azaleas may be purchased in various sizes as potted or balled and burlapped plants. Since in this area azaleas normally bloom in late April and early May, planting time is in March and early April and again in September and October. Potted plants may be set out at any time except during the first flush of growth.

THE PINXTERBLOOM (*Rhododendron nudiflorum*)

The small, usually white flowers are borne in great profusion. *Rhododendron roseum* has deeper-colored, fragrant flowers.

Always moisten the root ball before planting, by standing it in a tub of water for a few minutes and then setting it aside to drain.

SPACING: When a small azalea is planted it is difficult to visualize its height ten years hence, therefore, the tendency is to space plants close together. Four or five feet apart is advisable for most kinds. Generally, the spread of azaleas will be about the same as the ultimate height given in the catalogs. Plants that are placed two or three feet apart for immediate effect may be thinned when they begin to crowd, but the thinning must not be delayed too long.

SOIL: A well-drained, fibrous and spongy soil is the type azaleas prefer. In creating such soil our aim is to duplicate woodland conditions in which the yearly growth cycle provides a continual supply of decaying leaves. We would be fortunate if we had partially decayed oak leaves to mix with the soil, but since this seldom is the case, our best substitute is commercial peat. At times this is very dry when delivered and needs to be moistened by exposing the opened bale or bag to rain, or wetting it with the hose and turning it with a rake until it is uniformly moist. Canadian peat can be conditioned faster than German peat, but the latter is a little more acid.

Azaleas are shallow-rooted plants and in a well-drained location only the top 12-18 inches of soil need be prepared. If sufficient organic matter is available it is well to prepare an entire bed, but when azaleas are interplanted with other shrubs or evergreens, individual holes will suffice. Soil removed from a hole 2 feet in diameter and 1 foot deep equals approximately 3 bushels. By mixing from 1 to 1½ bushels of peat with the soil we have approximately a 50 per cent soil-peat mixture. At that rate a 6-cubic-foot bale of peat will be sufficient for four azaleas, and if the diameter of the hole is increased to 3 feet, one bale will be needed for every two plants. If good leaf mold or old manure is available either one or both could be used to replace half of the peat. As the soil and peat are being mixed, add a cupful each of sulphur and super-phosphate; and if the soil is inclined to be stiff, add about a bucketful of sand per plant.

While the hole is open, loosen the subsoil and mix in peat, leaves, or old manure. Firm the soil as it is returned to the hole so that when an azalea is planted the soil ball will be a little higher than the level of the surrounding area. This allows for settling of the spongy soil and also for the addition of an annual mulch. A slight depression should be left around the plant for water which will help settle the soil. The application of a mulch, about three inches thick, is the final step of the planting operation. A mulch retains moisture, discourages weeds, keeps the roots cool, and prevents rapid changes in temperature in winter. Oak leaves, if available, are preferred but other materials can be used such as peat, ground corn cobs, spent hops, tobacco stems, oak tow, sawdust and wood chips. It is advisable to mix peat with other mulching materials,

Mollis hybrid azaleas may be had in varying shades of salmon, yellow, orange, and rose colors.

for when used alone it sheds water when it becomes dry. A combination of oak leaves and peat, topped with a dressing of wood chips, would make a satisfactory mulch. The annual mulch is easily renewed each year in autumn when leaves are so plentiful.

WATERING: When watering azaleas during dry periods the use of a perforated plastic sprinkler will insure deep penetration without run-off or interference from the wind. On very hot days the plants will benefit by a syringing with the hose, morning and evening, to increase the humidity about the plants.

FEEDING: The continual decomposition of a mulch will supply food for the azaleas, and this may be supplemented with acid fertilizers formulated for camellias, azaleas, and rhododendrons. Such fertilizers may be mixed with an equal amount of cottonseed meal and spread around the plants in February and March and again in June, if necessary. The vigor of the plants is the best indicator of the amount and frequency of the applications. Apply 3 to 4 pounds per 100 square feet of bed space and ¼ to 1 pound per plant, in keeping with the size.

PRUNING: Compared with other plants in the garden, azaleas require very little attention. In the first ten years they seldom need any pruning except for the shortening of a few vigorous canes. Azaleas grow taller and broader each year, in a definite pattern, as new sets of branches develop at the base of the flowers. After ten or more years it will be noticed that the canes of some types of azaleas, like the Mollis, are an inch or more in diameter and that they do not produce flowers as freely as they once did. If one or two of such heavy canes are removed each year, by cutting them back almost to the ground, in a few years the entire plant can be rejuvenated. The new canes will be vigorous and will flower as freely as when the plants were young.

PESTS: The lace bug is a sucking insect that feeds on the underside of the leaves of azaleas and rhododendrons and also attacks chrysanthemums, perennial asters, and other garden plants. These insects have appeared some years on our potted azaleas, but so far have never been observed on any of the plants growing in the garden. Strange as it may seem, we can say that we have never had to spray our azaleas either for insect or fungous attacks. If lace bugs should appear, control them with sprays of nicotine, DDT, lindane, chlordane, or malathion. Spider mites are on the increase, and if they attack azaleas spray them with a miticide, such as Aramite.

Rabbits are fond of young azaleas but let the plants alone when they become woody. Most damage occurs in winter when the rabbits' normal food supply is frozen or covered with snow. People sometimes are unaware that rabbits are in their gardens, but if they find twigs that have been cut on the slant, as if with a knife, the evidence is that this pest is in the neighborhood and might return to do more damage. That being the case, the only possible way of protecting young azaleas is to

Rhododendron obtusum amoenum
An example of hose-in-hose flowers

Rhododendron mucronatum cuttings

These were made in December, rooted in a sand-peat medium in 70° greenhouse temperature. The photograph, made in April, shows cuttings with ample roots for planting in an outdoor frame.

surround the individual plants, or a bed of azaleas, with one-inch mesh wire netting 12 or 18 inches high. Individual cylinders of wire can be slipped over each azalea and held in place with wire or bamboo stakes.

Species and Hybrids: Although botanists group all species of azaleas and rhododendrons in the one big genus, Rhododendron, in horticultural literature and in catalogs they are usually treated separately. For instance, when information about a plant listed as *Azalea ledifolia alba* in catalogs is sought in a plant dictionary, it will be found under *Rhododendron mucronatum* instead of *Azalea ledifolia alba,* which is a synonym.

Like other groups of plants, it is possible to extend the blooming period of azaleas in a garden by selecting the early and late kinds. The first azalea to bloom in April in most years, when forsythia and narcissus are in flower, is *Rhododendron mucronulatum,* the Korean azalea, whose clusters of rosy-purple flowers appear before the leaves. The plant grows tall and narrow, and, according to Wilson, is found in dry and stony situations in its native habitat. Unfortunately, like the early magnolias, the flowers of this azalea are ruined in some years by late frosts.

The next species to flower is *Rhododendron Schlippenbachii* whose common name, the Royal Azalea, is much more pleasing and easily remembered. The slightly pink buds expand into large, white flowers. In the sixteen years that we have had this beautiful azalea its growth has been slow compared to other varieties planted in the same bed.

Rhododendron obtusum amoenum is a small-leaved, semi-evergreen azalea which eventually grows into a large mound as broad as it is tall. The plant is very twiggy and bears a profusion of hose-in-hose, rosy-purple flowers. A "hose-in-hose" flower is one in which there are two perfect corollas, one set

within the other. This azalea is unmindful of dry weather and is one of the easiest to grow. Because of its strong color, it is best planted against an evergreen background or combined with white or pale-pink and lavender azaleas. A striking combination of plants can be created by combining this variety with evergreens and white redbud.

The pinkshell azalea, *Rhododendron Vaseyi,* is a native of the mountains of western North Carolina. In St. Louis it blooms in late April and early May, and since the flowers are a delicate pink it is best planted in light shade.

Our native azalea, *Rhododendron nudiflorum,* the Pinxterbloom, grows to a height of six feet and about May 1st its white or pale-pink flowers appear just as the leaves unfold. *Rhododendron roseum* is similar and is preferred because of its fragrance and deeper-colored flowers.

In 1925 the seed firm of Henry A. Dreer, of Philadelphia, introduced a Kurume azalea named SNOW, which is a hose-in-hose variety, but this is not to be confused with the SNOW AZALEA, *Rhododendron mucronatum,* which has been grown in this country for more than a hundred years. The latter is listed in catalogs under various names — *Azalea indica alba, A. ledifolia alba, A. rosmarinifolia,* and varieties of *mucronatum.* Opinions differ as to where this azalea originated and whether the white form we have is a species or an albino form of a lavender-flowered azalea which Wilson named *Rhododendron mucronatum* var. *ripense.* It is semi-evergreen, with wide-spreading branches which grow horizontally to form a mound six to ten feet wide.

Of the seven azaleas described, three are native American species and the other four are from the Orient. One other hardy azalea that should be included in an azalea collection, is the Flame Azalea, *Rhododendron calendulaceum.* It is from the mountains of Virginia and the Carolinas and is the most colorful of the native American species.

GABLE HYBRID AZALEAS: In the southern Allegheny foothills, at Stewartstown, Pennsylvania, Joseph B. Gable has been hybridizing rhododendrons and azaleas for many years. In 1953 the American Rhododendron Society awarded Mr. Gable its gold medal in recognition of the fine work he is doing in creating hardy azaleas. More than thirty-five named varieties of the Gable azaleas are now commercially available and more are to come. For ten years we have grown two of the Gable varieties of which the first to bloom in late April is OLD FAITHFUL an orchid-pink, single-flowered variety; and a few days later ELIZABETH GABLE, a rose-pink, hose-in-hose, evergreen variety comes into flower. These plants are now four feet tall and equally broad. Until more of the Gable varieties are given a trial the following list of currently popular varieties will serve as a guide in making selections:

BOUDOIR —single, watermelon-pink
CAMEO —double, soft pink
ELIZABETH GABLE —double, rose-pink
ETHELWYN —single, light pink
HERBERT —single, crimson-purple
LOUISE GABLE —double, salmon-pink
PURPLE SPLENDOR —dark purple

ROSEBUD —double, pink
ROSE GREELEY —hose-in-hose, white
SPRINGTIME —single, pink

GLENN DALE HYBRID AZALEAS: In 1950 and 1951 we received a total of 167 clones of azaleas from the Bureau of Plant Industry, Beltsville, Maryland. The plants were small and have been growing in pots until such time as they are large enough for planting out. These plants, sent to us for trial, are a part of the greatest azalea breeding project ever undertaken, instituted in 1929 by Mr. B. Y. Morrison, Principal Horticulturist, Division of Plant Exploration and Introduction of the United States Department of Agriculture, until his retirement in 1951. Many of these clones are now listed in azalea catalogs, and as more information becomes available, it will be possible to select those kinds best suited for a given locality. The following is a suggested list of Glenn Dale varieties, seven of which are in our collection:

ANGELA PLACE —4′, white
ARCTIC —3′, white
BEACON —5′, near scarlet
CRINOLINE —5′, pink
CYGNET —4′, white
DAYSPRING —6′, pink
EROS —3′, pink
FASHION —6′, rose
GLACIER —5′, white
HELEN GUNNING —5′, white, pink margins
MARTHA HITCHCOCK —4′, white, magenta margins
MORNING STAR —6′, rose

Any one wishing to know more about these azaleas will find *Agricultural Monograph No. 20,* "The Glenn Dale Azaleas" by B. Y. Morrison, an interesting booklet. It may be obtained from the Superintendent of Documents, United States Government Printing Office, Washington 25, D.C. The price is 40 cents.

MOLLIS HYBRIDS: The Mollis hybrids originated in Europe about 1880 and have for parents *Rhododendron molle, Rhododendron japonicum* and Ghent hybrids (which in turn are the product of some seven American species), and *Rhododendron flavum* from eastern Europe. The Mollis hybrids are easily grown from seed in a variety of colors from the clearest yellow through rose to deep orange-red. The plants grow tall and broad, can be planted in full sun, transplant easily, and tolerate neutral and slightly alkaline soil. They have one minor fault, in that occasionally they emit a slightly unpleasant odor, but this should not deter any one from growing them.

EXBURY HYBRID AZALEAS: The late Lionel de Rothschild of Exbury, England, hybridized many azaleas in his lifetime, and now about fifty of the clones are available in this country. Several of these were mentioned by Mr. Fador Kernin in the January issue of the *Quarterly Bulletin of the American Rhododendron Society* as having withstood fifteen degrees below zero in Shelby, Nebraska, their only protection from the wind being tar-paper tubes, open at the top. If the Exbury hybrids can be grown in Nebraska they certainly are worth a trial here. This spring we will plant BASILISK and PINK DELIGHT at the Garden.

GROWING YOUR OWN AZALEAS: One can derive a great deal of enjoyment and satisfaction by propagating his own azaleas either by seeds or cuttings. Some azaleas produce an abundance of

MOLLIS HYBRID AZALEA SEEDLINGS IN A COLD-FRAME
After two or three years such plants are large enough for planting in their permanent location.

seed which is gathered during the fall and winter months. Much seed is lost when the capsules open and are shaken by the wind, but even after months of exposure to the elements, when the supposedly empty pods are gathered and vigorously shaken in a paper bag, more seed is collected than is needed for an average sowing.

Azalea seed may be sown in February in a greenhouse, or in April if only a cold-frame is available. Sphagnum moss, rubbed through a half-inch mesh wire-screen, is an excellent medium on which to sow the seed. The sphagnum is moistened, placed in a pot or pan, and firmed. The seed is sown evenly and dry sphagnum lightly sifted over it. The pot is then watered from below by standing it in a pan of water, or from above using a fine spray. A pane of glass will prevent drying of the surface and paper will protect the seed from the hot rays of the sun. A greenhouse bench, shaded by a lath screen suspended from the roof, is an ideal location for starting seedlings. Azalea seed germinates in three to four weeks, and after the seedlings are a week or two old they are benefited by a light feeding of liquid fertilizer. When the seedlings have two or three leaves, they may be transplanted to flats of peat and sand, or peat and perlite or styrafoam, where they will remain until transplanted to pots or prepared beds the following spring. During the first winter the seedlings need the protection of a cool greenhouse or a good coldframe. By the third year there will be some flowers and by the fifth year many of the plants will be large enough for planting out in their permanent location.

A hybrid azalea can only be perpetuated vegetatively, and by that is meant that a piece of the plant must be grown on its own roots either by cuttings or layering or by grafting onto some other azalea stock plant. The simplest and quickest of these methods is by cuttings, but it cannot be accomplished as easily as rooting a geranium. The best rooting medium is an equal amount of peat and sand, or peat and vermiculite. The propagator must rely on his knowledge and experience to determine when cuttings

AZALEA SEEDLINGS FOUR MONTHS OLD

For best results, seedlings are transplanted when they have developed three or four true leaves.

have reached the proper degree of firmness for insertion in the rooting medium. This varies with the kind of azalea and the time of the year. Cuttings may be taken when the shoots of the current season have become firm, which usually is about four to six weeks after flowering. When they are gathered they are dropped in water or wrapped in damp paper and prepared for insertion in the rooting medium as soon as possible to avoid wilting. The preparation consists in removing a few basal leaves, dipping the end of the cutting in No. 2 or No. 3 Hormodin powder and dibbling it into the pot or flat of rooting medium. When all cuttings are inserted, they are watered with a sprinkling can and the flat or pot is covered with a tent of polyethylene sheeting, placed in a sheltered and shaded part of the garden or coldframe, and shielded from the direct rays of the sun. Except for an occasional watering, the cuttings will need no further attention until they are rooted, which will require sixty days or longer, depending upon the kind of azalea, the temperature, and the time of year. When cuttings are rooted they are hardened off before potting by gradually removing the plastic sheeting. Deciduous azaleas are rooted in the spring, but some of the evergreen and semi-evergreen kinds may also be rooted in the fall and as late as December.

Plants may also be started by layers if a plant with pliable canes is available, but the process is slow, requiring at least a year.

SOME FACTS ABOUT SHAW'S GARDEN

The Missouri Botanical Garden (the official name chosen by Mr. Shaw) carries on the garden established by Henry Shaw over a century ago at TOWER GROVE, his country home. It is a private institution and has no support from city or state. The old stone walls and cast-iron fences, the Linnaean House, the Museum, the Mausoleum, and the TOWER GROVE mansion all date from Mr. Shaw's time. Since his death, as directed in his will, the Garden has been in the hands of a Board of Trustees who appoint the Director.

The Garden is open every day in the year (except New Year's and Christmas) from nine A. M. until seven P. M. (April to November) and until six (November to April) though the greenhouses close at five. TOWER GROVE, itself, Mr. Shaw's old country home, is open from one until four. The Garden is nearly a mile long and has several entrances. The Main Entrance, the one used by the general public, is at Tower Grove and Flora Place on the Sarah bus line (No. 42). The Park Southampton buses (No. 80), direct from downtown, pass within three blocks of this entrance and stop directly across the street from the Administration Building at 2315 Tower Grove Avenue. The latter is the best entrance for students, visiting scientists, etc. It is open to such visitors after 8:30 a. m., but is closed on Saturdays, Sundays, and holidays. There is a service entrance on Alfred Avenue, one block south of Shaw Avenue.

Since Mr. Shaw's time an Arboretum has been developed at Gray Summit, Mo., adjacent to State Highways 50 and 66. It is open every day in the year and has two miles of auto roads as well as foot trails through the wild-flower reservation. There is a pinetum and an extensive display of daffodils and other narcissi from March to early May.

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